Quantifier Phrases and Quantifier Float

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Introduction

Sportiche (1988) proposed a new analysis of the pheonmenon of Quantifier Float, illustrated in (1) (see also Kayne (1975)).

(1) a. Les enfants mangent tous la viande.
the children eat all-MPL the meat.
'the children all eat the meat.'

b. Les filles mangent toutes la viande.
the girls eat all-FPL the meat.
'the girls all eat the meat.'

In essence, he argued that the clausal subject is base-generated internally to a verbal projection and that the subject, les enfants, is raised into the specifier of I by the application of NP movement. Together with the obligatory raising of V to I(nfl) in French, this creates the illusion that the quantifier (Q) is floated rightwards. The derivation is

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illustrated in (2). Note that in Sportiche's system, Q is generated as an adjunct to NP.

(2)

[$_{NP}$Les enfants] I+mangent [$_{V^n}$[$_{NP}$tous[$_{NP}$e]] [$_{VP}$ [$_{V}$t$_{V}$]...]]

This paper analyzes a range of Hebrew data which support Sportiche's basic insights rather strongly, but require some modification in their execution. In particular, we discuss the categorial status of Q and examine the internal structure of the phrase containing Q and the DP it quantifies over. In addition, we investigate the type of movement undergone by the subject which is fronted leftwards over the quantifier. Our basic claim is illustrated in (3), where an empty category appears to the left of Q. We attempt to motivate the existence of this empty category for Hebrew as well as for French.

(3) S-structure for Quantifier-Float Configuration:

[NP]$_i$...[$_{QP}$ [e]$_i$ Q [e]$_i$]

I. The Structure of QP

Consider, first, the alternation illustrated in (4).

(4) a. 'etmol kol ha-yeladim zarku 'avanim.
yesterday all the-children threw stones.
`yesterday all the children threw stones.'

b. 'etmol zarku kol ha-yeladim 'avanim.
yesterday threw all the children stones.
meaning: same as (4a).

In (4a) both Q and the quantified phrase appear on the surface to the left of the verb; let us assume that they are in [Spec/I]. In (4b) they appear between the verb and the object. There is independent evidence which we will not review here, that in Hebrew the verb is in I at S-structure (Shlonsky (1987). Following Sportiche, we hypothesize that the quantifier and the quantified phrase occupy the specifier position of a verbal projection V^n. The presence of a clause-initial adverb permits the subject to remain in its D-structure position for reasons which, again, require a separate

discussion which lies beyond the scope of the present paper (see Doron and Shlonsky (forthcoming)).

Anticipating a little, we conjecture that the fact that the subject phrase can remain in its D-structure position implies that it can be Case-marked in that position. We assume that I assigns Case to the subject phrase by government (cf. Koopman and Sportiche (1988)).

The application of standard diagnostics demonstrate that Q and the quantified DP form a constitutent. They can be clefted, pseudo-clefted, topicalized and conjoined as a unit, as shown in (5).

(5) a. ze hayu kol ha-yeladim Se-zarku 'avanim.
it was all the-children that-threw stones.
`It was all the children who threw stones.'

b. mi-Se zorek 'avanim ze kol ha-yeladim.
who-that throws stones it all the-children.
`those that throw stones are all the children.'

c. kol ha-yeladim, ani batu'ax Se-zorkim 'avanim.
all the-children, I sure that-throw stones.
`all the children, I'm sure throw stones.'

d. 'etmol zarku Stei banot ve-kol ha-banim
yesterday threw two girls and-all the-boys
'avanim 9al ha-mora.
stones on the-teacher.
`yesterday three girls and all the boys threw stones at the teacher.'

Moreover, we believe that Q is neither an adjunct nor a specifier of DP. In all the examples given so far, Q linearly precedes the quantified phrase. However, it can also follow it, as in (6).

(6) a. 'etmol ha-yeladim kul-am zarku
yesterday the-children all-[3MPL] threw
'avanim.
stones.

b. 'etmol zarku ha-yeladim kul-am
yesterday threw the children all-[3MPL]
'avanim.
stones.
Meaning: Same as (4).

When the quantified phrase precedes Q, however, Q obligatorily bears a clitic which agrees with the quantified phrase to its left in person, number and gender. Thus, when the quantified DP contains e.g., a second person masculine plural noun, the clitic must also manifest second person masculine plural features, as in (7).

(7) 'atem kul-xem zarak-tem 'avanim.
you-MPL all-[2MPL] threw-[2MPL] stones.
`You all threw stones.'

This sort of alternation is entirely optional, but if the quantified DP does appear to the left of the quantifier, a clitic is obligatory; it is impossible otherwise (8). (Note that Q also undergoes a phonological change of /o/ -> [u] due to the presence of the clitic.)

(8) a. *'etmol zarku ha-yeladim kol 'avanim.
yesterday threw the-children all stones.

b. *'etmol zarku kul-am ha-yeladim
yesterday threw all-[3MPL] the-children
'avanim.
stones.

Clitic hosts in Hebrew are always heads, i.e. X^0 categories. This is illustrated in (9) with third person clitics on non-finite verbs, nouns, prepositions and the negative particle 'eyn, which Doron (1983) argues is an $Infl^0$ element. The data show that heads form a natural class in their capacity to host clitics. Since Q patterns with the other heads in hosting clitics, we conclude that it is a head, namely Q^0.

(9) a. bati lir'ot-o/-a/-am.
(I) came to see-[3MS]/-[3FS]/-[3MPL].
`I came to see him/her/them.'

b. bati lir'ot 'et 'axot-o/-a/-am.
(I) came to see OM sister-[3MS]/-[3FS]/-[3MPL]
`I came to see his sister/her sister/their sister.'

c. bati lir'ot 'et ha-seret 9al-av/
(I) came to see OM the-film about-[3MS]/
-eha/-ehem.
-[3FS]/-[3MPL].
`I came to see the film about him/her/them.'

d. Dani 'eyn-o Samen. Rina 'eyn-a Smena.
Dani neg-[3MS] fat-MS. Rina neg-[3FS] fat-FS.
`Dani is not fat.' `Rina is not fat.'

hem 'eyn-am Smenim
they neg-[3MPL] fat-MPL

The phrase consisting of Q preceded by the quantified DP, as in (6), forms a constituent of the same sort as the phrase consisting of Q followed by the quantified DP. The two can be conjoined with each other, as in (10), although the result is somewhat marginal for stylistic reasons.

(10) kol ha-banim ve ha-banot kul-an ra'u seret.
all the-boys and the-girls all-[3FPL] saw film.
`All the boys and all the girls saw a film.'

We therefore assume that the D-structure representation of clauses containing Q followed by the quantified phrase (i.e., when Q precedes the quantified phrase and does not agree with it) contains a sub-constituent such as (11), where Q heads a QP and the quantified phrase is a DP sister to Q.

(11) $[_{QP}\ [_{Q'}\ Q\ DP]]$

The semantic restrictions which Q imposes on the quantified DP, specifically the requirement that it desginate a plural set, can now be seen as a subcategorization requirement realized under sisterhood.

We take the cases where the DP complement of Q appears immediately to its left, as in (6), to be derived by movement of the quantified DP to the specifier position of Q, as in (12).

(12) $[_{QP}\ NP_1\ [_{Q'}\ Q_{[AGR]}\ e_1]]$

Movement of the DP leaves a trace which must meet the ECP, that is, it must be both head governed and antecedent governed. It is antecedent governed by the DP in [Spec/Q], which independently of anything else argues agains the position put forth by Chomsky in Barriers that heads protect elements in their immediate c-command domain from antecedent government, the view which Rizzi has termed rigid minimality.

As for head government, we follow Rizzi (1990) in assuming that not all heads are inherent head governors, the class being restricted to the lexical heads and the inflectional ones. However, a deficient governor can become an appropriate head governor if it bears agreement. Overt and covert movement of Agr to Comp serve to turn Comp into a head governor for a subject trace in Rizzi's system. A natural extension of this idea is to assume that Agr can be generated on a head, as a grid of features, thanks to which the head in question becomes a licit head governor. This is what explains the obligatory presence of the agreement clitic in configurations such as (12).

The impossibility of the clitic in e.g. (8b), can be subsumed under the generalization that agreement is a relation which holds exclusively between a head and a local subject. Thus, (8b) is parallel to the French sentence in (13) below, which shows that past participle agreement does not hold with objects in-situ. By parity of reasoning, the quantified DP in (8b) is not a formal subject of Q, i.e. a specifier and therefore (8b) is not an agreement configuration.

(13) J'ai repeint/*es les chaises.
I have repainted/FPL the chairs.
`I have repainted the chairs.'

It might be possible to derive the strict locality of agreement by arguing with Rizzi that the grid of phi-features which appears on Q must be licensed by coindexation with a specifier. Agr on Q can then be viewed as activating the specifier of Q making it a possible landing site for the DP. In the absence of Agr, [Spec/Q] is simply not generated, as in (11).

II. Quantifier Float in Hebrew

Having established that Q is a head and that DP is its complement and having examined the internal syntax structure of QP, let us now turn to the genuine cases of quantifier float. Consider (14).

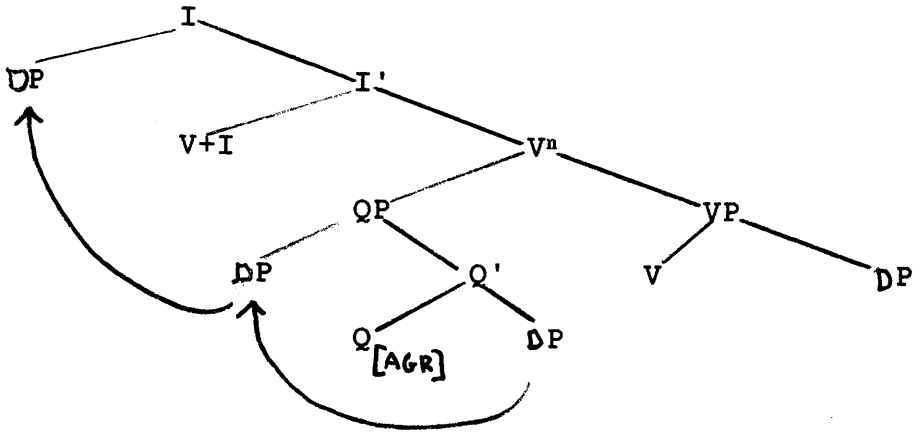
(14) ha-yeladim zarku kul-am avanim.
the-children threw all-[3MPL] stones.
`The children all threw stones.'

The quantified DP is moved to [Spec/I] stranding Q, as in the French examples discussed by Sportiche. Interestingly, however, Q obligatorily hosts an agreement clitic as shown by the ungrammticality of (15).

(15) *ha-yeladim zarku kol avanim.
the-children threw all stones.

We conjecture that the S-structure of (14) must be as in (16), where movement to [Spec/I] proceeds via [Spec/Q].

(16)



The explanation for the extra step involved in raising the quantified DP is quite straightforward in light of the previous discussion. The trace of DP in its D-structure position as sister to Q must be head governed. This is achieved by generating or inserting an agreement grid on Q which transforms it into a licit head governor. The agreement element itself must be licenced by coindexation with a specifier, so movement must proceed through [Spec/Q].

The intermediate empty category in [Spec/Q] must itself by properly governed. We take the clausal inflection I⁰ to be the head governor and the clausal subject to be the antecedent. In order to make sure that QP is not a barrier to government of its specifier by I, we adopt Chomsky's stipulation in Barriers that specifiers of an L-marked category are themselves L-marked. Thus, if Vⁿ is L-marked by I to which V has adjoined by head movement, QP is also L-marked and hence not a barrier.

III. Quantifier Float in French

In French the phrase consisting of Q and the quantified DP is also a constituent, as evidenced by the constituency tests in (17).

(17) a. C'etait tous les enfants qui jetaient des
it was all the children who threw
pierres.
stones.
`It was all the children who threw stones.'

b. Tous les enfants, je suis sur, jetaient des
all the children, I am sure, threw
pierres.
stones.
`All the children, I am sure, threw stones.'

c. Les filles et tous les garcons jetaient des
the girls and all the boys threw
pierres.
stones.
`The girls and all the boys threw stones'

The most restrictive and strongest claim we could make is that Quantifier Float in French proceeds essentially like Quantifier Float in Hebrew. Let us entertain the hypothesis that the French float structure also contains an empty category to the left of Q, i.e., in [Spec/Q], and that Quantifier Float is engineered by associating an Agr element with Q so as to turn it into a licit governor.

Yet there is one major difference between French and Hebrew: A lexical DP may appear in the [Spec/Q] in the latter but not in the former; contrast the sentences in (18) with those of (6) above or (19) below. (Note that in both subject tous phrases and object tous phrases the quantified DP may not precede the quantifier.)

(18) a. *Elle a lu [$_{QP}$les livres tous [e]].
she has read the books all.
`She has read all the books.'

b. *[$_{QP}$Les enfants tous [e]] ont mange.
the children all have eaten.
`The children have all eaten.'

(19) a. hi qar'a 'et [$_{QP}$ha-sfarim kul-am [e]].
she read OM the-books all-[3MPL].
`She has read all the books'

b. [$_{QP}$ha-yeladim kul-am [e]] axlu.
the-children all-[3MPL] ate.
`The children all ate.'

On the other hand, an empty category may, by hypothesis, appear in French [Spec/Q], as shown in (20).

(20) a. Les livres que j'ai lus presque
the books which I have read-MPL almost
[$_{QP}$[e] tous [e]]...
all...
`The books almost all of which I have read...'

b. les enfants ont [$_{QP}$[e] tous [e]] mange.
the children have all eaten.
`The children have all eaten.'

c. Elle les a lus [$_{QP}$[e] tous [e]]
she them has read all
`She has read everything'

Notice the grammaticality of (21) where the quantified DP follows the quantifier and contrast it with the unacceptable (18a). We take the structure of (21) to be (11).

(21) Elle a lu [$_{QP}$tous les livres].
she has read all the books.
`She has read all the books.'

The impossiblity of a lexical DP in [Spec/Q] bears resemblance to another phenomenon in French, namely, past participle agreeement, as analyzed in Kayne (1990). Again, the relevant generalization is that there is an asymmetry between lexical DP's and empty categories. The latter, but not the former, can occupy the position to the left of the past participle, the position which triggers agreement.

(22) a. Elle les a [e] repeintes.
she them had repainted-FPL.
`She had them all repainted.'

b. Quelles tables est-ce que tu as
which tables *you have*
[e] repeintes?
repainted-FPL?
`All of which tables have you repainted?'

c. *Elle a les tables repeintes.
she has the tables repainted-FPL.
`She had the tables repainted.'

Kayne explains this assymetry by recourse to Case theory. The auxiliary avoir cannot assign Case to an NP (DP) to its immediate right, presumably in the specifier of the object agreement node (cf. Chomsky (1990) and since that position heads an A chain, Kayne stipulates that it must receive Case. A' movement is possible through that position however, as evidenced by the acceptability of past participle agreement when clitic movement or wh-movement have occured, as in (22a,b). This leads Kayne to posit another empty category adjoined to Agr$_o$P. Since the adjoined position is not an A position, Case need not be assigned to it.

While the facts concerning what may or may not appear to the left of the quantifier in French basically parallel those of clauses containing agreeing past particples, Kayne's explanation does not directly carry over to them. We believe, however, that the two phenomena, that of Quantifier Float and that of past participle agreement, yield to a single analysis.

Notice, first, that, Kayne's analysis immediately excludes (23), on par with (22c). In general, an object cannot follow avoir in French.
(23) *Elle a [tous les livres] lu(s).
she has all the books read(PL).
`She has read all the books.'

The more interesting cases, though, are those in (18). Consider (18a). Although the entire object QP is in a Case position, following the past participle, the quantified DP cannot precede Q.

Consider the possibility that it is not QP which requires Case, but rather, the DP within it. The

quantifier is a functional category, a sort of secondary predicate, but the actual argument is the DP within it. Suppose, now, that in such instances, Case is assigned to the DP via the quantifier. Q transmits Case from a Case assigning head such as a past participle to the DP. One obvious condition for Case transmission is that QP and its head be governed by a Case assigning head. This trivially excludes (23) since avoir is not an assigner of Case.

Now,Consider the following principle:

(24) Case Transmission

A functional head (e.g., Q) can transmit Case to a DP which is either governed by it or strongly agrees with it.

(24) provides a mechanism for transmitting Case either to a DP in complement position of Q by government or to a DP in its specifier position by agreement.

Since Q governs the D-structure position of the quantified DP and QP itself is governed by a Case assigning participle, (21) is predictably grammatical. In (18a), on the other hand, Q does not govern the quantified DP in [Spec/Q] so Case cannot be transmitted by Q through government.

Recourse can now be made to the second strategy for Case transmission, namely, strong agreement. Yet even the utilization of this option fails to yield a grammatical output in French. To see why this is so, consider some independent differences between French and Hebrew. In French, agreement is found not only when the quantified DP is fronted over Q, but also when it is in situ, in the complement position of Q, as in (25).

(25) J'ai vu tous les enfants/ toute la
I have seen all-MPL the children/all-FS the
famille/toutes les filles.
family/all-FPL the girls.
`I have seen all the children/ all the family/
all the girls.'

We take these facts to mean that the type of agreement manifested on the French quantifier is not a reflex of specifier head coindexing, as in Hebrew, but feature copying of the sort discussed in e.g. Halle (1990).

Another difference is that Hebrew Q manifests person agreement while French Q does not.

Rather than drawing the consequence that French Q simply does not agree with its specifier, let us say that in Hebrew, Agr on Q is strong in that it is overtly manifested while in French it is weak, to borrow terminology from recent work on the clausal inflectional system.

Thus, in French, a lexical DP in need of Case cannot appear in the specifier position of Q even if QP itself occupies a Case marked position. This is so because Q does not strongly agree with its specifier and hence cannot transmit case to it. By the same reasoning, (18b) is ruled out as are all cases where a lexical DP surfaces in [Spec/Q] in French.

In Hebrew, as we have seen, agreement is overtly manifested on Q and phi features are discretly represented. Hence, by definition, Agr is strong. Case can be transmitted to a lexical DP in [Spec/Q], accounting for the grammaticality of (26).

(26) ra'iti 'et [$_{QP}$ha-yeladim kul-am [e]].
(I) saw OM the-children all-[3MPL].
'I saw all the children.'

A final relevant difference between French and Hebrew is that Hebrew generally allows a subject to remain in V^n at S-structure while in French this possibility is highly restricted if at all available. To account for the Hebrew sentence (4b), we earlier assumed that in Hebrew, nominative Case can be assigned to a subject in situ by government from I. In French, however, this option is not readily available and NP movement is obligatory.

Wh-movement and clitic movement (of non-subjects) may proceed through [Spec/Q] in French because no Case

needs to be assigned to the intermediate trace in [Spec/Q]. This is so because the trace of the quantified DP in the complement position of Q can serve as the Case-marked variable. Under such circumstances, only the ECP requires the intermediate empty category. Direct movement from the complement position of Q would leave an offending trace.

Thus, [Spec/Q] serves as an intermediate A' landing site for wh-movement and clitic movement and facilitates A' movement of a wh-phrase or a clitic by permitting the ECP to be satisfied by the variable in the complement position of Q. In cases of NP-movement of the quantified DP (quantifier float), [Spec/Q] functions as an A position, although not as a Case position.

French [Spec/Q] is never a Case position but it may form an intermediate link in both A and A' chains. Therefore, lexical DP's cannot appear in [Spec/Q] but only empty categories.

In Hebrew, on the other hand, [Spec/Q] is a Case position and therefore admits lexical DP's as well as empty categories.

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